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ABSTRACT

Findings of a study that examined the application of total quality leadership to understand effective leadership practices are presented in this paper, which views total quality leadership as a combination of expert thinking and transformational leadership practices. Data were derived from interviews with 9 secondary school principals (4 female and 5 male) in a large, urban school system, who were identified as effective school leaders, and from a survey of 295 teachers in the 9 schools. Findings showed that one principal exemplified total quality leadership in practice. However, the capacity to exhibit transformational practices is not sufficient for total quality leadership. Two principals demonstrated premature widespread application of such practices, and two applied such practices in the service of narrow purposes. In addition, school leaders may be highly expert thinkers, but fail to act as transformationally as do their less expert colleagues. In some cases, high levels of transformational practice are not uncontestable indicators of highly expert thinking. Expert thinking appears to create a propensity to act transformationally, in the long run, but is no guarantee for the use of transformational practices. In conclusion, transformational leadership theory is not sufficient for total quality leadership because it awards too little explicit weight to the mind of the leader. Five tables are included. (Contains 56 references.) (LMI)

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Total Quality Leadership: Expert Thinking plus Transformational Practice

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Total Quality Leadership:
Expert Thinking plus Transformational Practice

> "As organizational leaders struggle to lead their organizations to become higher performing, quality organizations, there is an increasing recognition that a new leadership paradigm is required to successfully develop and sustain a motivated and committed workforce"
>
> (Horine & Bass, 1993. p. 1)

The new "paradigm" alluded to in the opening sentences of Horine and Bass' paper is transformational leadership. This form of leadership, they argue, is demanded by today's restructuring organizations, especially those organizations inspired by the goal of "total quality management" (TQM). Many such organizations are attempting to move, for example, from fixed standards to continuous improvement; from individual process systems to team process systems; from control and command to commitment and teamwork (e.g., Bradley, 1993). These are several among the many of the changes that need to be made if organizations are to develop cultures defined by constant attention to quality, to the improvement of customer satisfaction: "... the focus on customer satisfaction through quality must be built into the management processes of the organization, ... the very fabric of organizational life, the organization's culture, must define and support TQM" (Sashkin & Kiser, 1992, p. 25).

Empirical evidence argues persuasively that transformational leadership fosters many of the changes apparently required to accomplish the purposes of a total quality organization. Such leadership has been shown, for example, to liberate the capacities of organizational members (Conger, 1989), to increase commitment to organizational goals (Leithwood, Jantzi & Fernandez, 1993), to stimulate extra effort on behalf of the organization's mission and to provide greater job satisfaction (Seltzer & Bass, 1990). There is good reason to believe, in sum, that the move toward total quality organizations would be well served by the adoption of transformational leadership practices, as Horine and Bass claim.

Total quality organizations and transformational leadership, while concepts developed in non-educational organizations, are of increasing interest to those

attempting to restructure schools (e.g., Willis, 1993; Bonstingl, 1992; Leithwood, 1992; Sergiovanni, 1990). The client-oriented focus of TQM, for example, reflects the commitment most educational restructuring initiatives have made to create a role for parents as partners in their childrens' education and to redesign schools up from a constructivist model of student learning (Murphy, 1991; Newmann, 1993). Self-managing teams empowered to improve the quality of services they provide to customers, a central feature of TQM for example, reflects the importance that transformational leaders attach to developing consensus about group goals and providing support to groups and individuals in pursuit of those goals.

We do not have a quarrel with these developments: indeed, we think they offer substantial promise. But we do have a worry. And the worry is fueled by the well-known tendency for educational innovation to be faddish, often to be fatally simplistic in what is selected for implementation and frequently to assume the existence of a "silver bullet" - one simple solution to a complex network of problems. With this in mind, it is important, in our view, to forcefully draw attention to a dilemma associated with applying the "new leadership paradigm" in the interests of a total quality agenda for schools.

The dilemma is this. Based on the available research evidence, transformational leadership practices appear to offer promise across many organizational contexts, in general, striving toward total quality goals. But total quality improvements do not occur in general contexts. They occur in specific and always partially unique contexts. Such contexts present leaders with unpredictable problems to solve, contexts in which productive leadership responses will be contingent upon circumstances unique to the context. So, for example, there will be some school contexts in which it will be very effective for a principal to work hard on developing, with the school community, a vision for the school - good transformational leadership practice. But there also will be school contexts already imbued with a vision in which the school community strongly believes. It may be unproductive for new principals entering such school contexts to spend time vision building. More likely, the problem for these principals is to figure out what leadership initiatives will take the vision forward (likely within a broad framework of transformational practices).

This takes us to the argument fleshed out in the remainder of the paper:

1. In order for school leaders to be most productive, they need to think expertly about their own school contexts and the consequences for the practices which they choose;
2. Total quality leadership combines such expert thinking with the capacities to act transformationally, when such actions are warranted;
3. School leaders may be highly expert thinkers and yet not act as transformationally as do their less expert colleagues, in some circumstances; furthermore, high levels of transformational practice are not uncontestable indicators of highly expert thinking.

Data from a recent study carried out in nine secondary schools in Ontario, Canada are used to demonstrate the meaning and plausibility of each of the elements of this argument.

Framework

If "total quality leadership" depends on a combination of expert thinking and transformational leadership practices, we need to understand what each of these factors mean.

Expert Thinking[1]

Our meaning of expert thinking has its lineage in information processing orientations toward human problem solving; this is a lineage which, for our purposes, began with Newell and Simon's (1972) seminal work and is encapsulated to the present in Posner's (1989) edited volume. But the most direct and precise sources of this meaning are to be found in very recent research applying such orientations to better understand the thought processes of educational leaders (for example, Hallinger, Leithwood & Murphy, in press; summer 1993 issue of *Educational Administration Quarterly*).

Information processing orientations to problem solving are embedded in a broader theory of how the mind works. This theory consists of hypothetical structures and relationships explaining why people attend to some aspects of the information available to them in their environments, how their knowledge is stored, retrieved and further developed and how it is used in solving problems (see, for example, Gagné, 1985; Newell, Rosenblum & Laird, 1989; Rumelhart, 1989).

From this perspective, problems are defined as circumstances in which a gap is perceived between a current state and a more desirable state (Gagné, 1985; Hayes, 1981). When both states are clearly known and the procedures to follow (or operators) to get from one to the other are also known, a problem is considered routine or well structured. Lack of knowledge about any of these three elements in the "problem space" (Newell & Simon, 1972) makes a problem less well structured. Hence, the objective complexity of the problem and the relevant knowledge possessed by the solver combine to determine the degree of novelty or structure of a problem. So, for example, working with a school staff to develop a school improvement plan is a problem of substantial objective complexity, requiring specialized technical know-how, refined interpersonal skills, and extensive information about district policies and local community concerns. But the subjective complexity of this problem varies enormously. For the novice principal, problems don't come much more complex than this; for the experienced expert, the problem has long since become routine. In sum, if the solver thinks the problem is ill structured, it is.

Information processing orientations to problem solving devote considerable attention to the concept of "expertise" and the patterns of thought which distinguish between those who possess high levels of expertise and others. Expertise is associated with both effective and efficient problem solving within a particular domain of activity (like leading a school). Research across many domains suggests, for example, that experts: excel mainly in their own domains; perceive large meaningful patterns in their domains; solve problems quickly with few errors; and have superior short and long term memories for information in their domains. Experts also represent problems at deeper, more principled levels than novices; they spend more time than novices interpreting (as distinct from solving) problems. And experts are able to monitor their own thinking much better than are novices (Glaser & Chi, 1988). The amount of domain-specific knowledge possessed by experts and the way it is organized is offered as the primary explanation for these attributes (Van Lehn, 1989; Nickerson, 1988-1989). General problem-solving processes or heuristics, in the absence of such knowledge, are not considered powerful tools for problem solving. Rather, such processes help people gain access to useful knowledge and beliefs that they otherwise may have overlooked (Bransford, in press).

Well-structured problems, usually those repeatedly encountered by experts, are solved with little conscious thought. The problem is recognized as an instance of a

category of problems about which the expert already knows a great deal. Such recognition permits the expert access to all of the knowledge he or she has stored in long term memory about how to solve that category of problem. But because no comparable store of knowledge is available for ill-structured problems, the expert needs to respond in a more deliberate, thoughtful manner.

One product of recent research using this information processing orientation to better understand the thinking of educational administrators is our own multi-component model of expert problem-solving processes (e.g., Leithwood & Stager, 1989; Leithwood & Steinbach, 1991, in press). This model assumes that there are two general categories of processes involved in problem solving: understanding and solving (Hayes, 1981; Van Lehn, 1989; Voss & Post, 1988).

Understanding processes serve the purpose of generating an internal representation of the problem - what a school leader believes the problem to be. Solving processes aim to reduce the gap between current and desired states - how the school leader will transform the current state into the more desirable goal state. Understanding and solving often interact during the course of problem solving as feedback from initial steps taken toward a solution builds a richer understanding of the problem. Both sets of processes require searching the contents of memory for existing knowledge helpful in either understanding or solving the problem.

Our multi-component model of expert problem solving includes two components which address primarily understanding: Interpretation and Goal Setting. Two components are concerned primarily with solving: Constraints and Solution Processes. Components of the model labelled Principles/Values and Mood seem equally relevant to both understanding and solving. The remainder of this section provides an explanation of the cognitive processes encompassed by each component, although the dynamic, interactive and non-linear nature of the mental processes associated with the components is likely understated. In addition, characteristics of expertise in relation to each component are described, based on our own prior research with educational administrators.[2]

Understanding processes: interpretation, goal setting. School leaders are bombarded with much more information from their environments than they can possibly think about. Furthermore, because this information frequently presents itself as an untidy "mess", rather than a clearly labelled set of possibilities, there may be a host of potential problem formulations. Problem interpretation is an instance of giving meaning to and evaluating such information (Kelsey, in press). Meaning is created as newly encountered information is compared with the organized

contents of long term memory - which the school leader thinks might be relevant (Van Lehn, 1989).

Prior evidence from school leaders suggests that, as compared with non-experts, experts:

- *develop a relatively clearer understanding of the problem before attempting to solve it;*
- *devote more time and effort to the initial formulation of ill-structured problems;*
- *are more inclined to view the immediate problem in its relationship to the broader mission and problems of the organization.*

Understanding an ill-structured problem sufficiently well to solve it usually requires decomposing it into pieces that are more manageable (Newell, 1975; Hayes, 1980). This begins to transform the often abstract, general interpretation of an ill-structured problem into a set of more precise goals which can serve as targets for problem solving activity (Voss & Post, 1988). Given these more precise goals, a school leader is better able to compare the current state with the goal at each stage of the process, as is normally possible with well-structured problems (Greeno, 1978).

Prior research suggests that expert as compared with non-expert school leaders:

- *adopt a broader range of goals for problem solving which consider all stakeholders;*
- *set goals that involve implications for students and program quality.*
- *vision for the school is considered in order to set appropriate goals.*

Solving processes: constraints, solution processes. The distinction between well-structured and ill-structured problems is a matter of degree. How much a school leader already knows that is relevant to solving a problem is one factor in determining the extent to which a problem is well-structured. Another equally important factor is the number of constraints that must be addressed in solving the problem (Reitman, 1965; Voss & Post, 1988).

As compared with non-experts, prior research suggests that expert school leaders:

- *more adequately anticipate many of the constraints likely to arise during problem solving;*

- *show a greater tendency to plan, in advance, for how to address anticipated constraints;*
- *respond more adaptively and flexibly to constraints which arise unexpectedly;*
- *do not view constraints as major impediments to problem solving.*

The overt or covert steps or actions taken in order to achieve goals for problem solving and to overcome constraints is our meaning of solution processes. Such actions or steps result from a deliberate search through memory for relevant procedural schema. These are structures in the mind about how to perform certain actions, a set of instructions for action - for example, how to develop a budget or how to resolve a conflict with a parent.

Previous studies of school leaders solving problems individually have found that, as compared with non-experts, experts:

- *develop a deliberate solution plan;*
- *identify detailed steps to be taken;*
- *stress the importance of thorough information collection;*
- *consult with relevant individuals or groups;*
- *monitor the progress of the solution and plan for follow-up.*

Understanding and solving: values and mood. A value is an enduring belief about the desirability of some means or action. Once internalized, a value also becomes a standard for guiding one's actions and thoughts, for influencing the actions and thoughts of others and for morally judging oneself and others. Conceptualized in this way, values have a pervasive role in problem solving. They shape one's view of the current and desired goal state and figure centrally in the choice of actions to reduce the perceived gap.

Our own research with educational administrators (Begley & Leithwood, 1991; Campbell-Evans, 1988; Leithwood & Steinbach, 1991a) suggests that experts in comparison with non-experts:

- *are more aware of their values;*
- *use their values more regularly in solving ill-structured problems;*
- *use values as substitutes for knowledge in solving ill-structured problems.*

Knowledge is stored in the mind in several forms: words and pictures, for example. Furthermore, what is meant by "knowledge" goes considerably beyond the purely cognitive content implied by the term. In addition to values, as discussed above, other affective states or feelings also are a part of knowledge structures. A school leader not only has stored in mind a procedure for facilitating the decision making of staff, she or he also has associated (and therefore unavoidable) feelings about carrying out the procedure - despair, elation, fear, boredom and the like. Both the nature and strength of these feelings shape the mood experienced by the school leader during problem solving.

Along with personal goals and the knowledge one possesses, mood has an important influence on the degree of cognitive flexibility one is able to exercise during problem solving (Showers & Cantor, 1985). Intense moods (e.g., anger, frustration) reduce such flexibility, thereby limiting problem solving effectiveness. Consistent with this explanation, our research with school leaders has demonstrated that, in contrast with non-experts, experts:

- *are better able to control intense moods and remain calm during problem solving;*
- *are more self-confident about their ability to solve ill-structured problems;*
- *are more likely to be reflective about their behavior, thoughts and moods.*

Transformational Leadership[3]

Our meaning of transformational leadership is generally consistent with its treatment in non-educational organizations. Hunt (1991), for example, traces this meaning, especially the idea of charisma, to the early work of Max Weber. Contemporary, mature forms of transformational leadership theory were proposed by Burns (1978) and then by Bass and his associates (e.g., Bass, 1985; Bass & Avolio, 1989; Bass, Waldman, Avolio & Bebb, 1987) as well as others in non-educational contexts (e.g., Podsakoff, Todor, Grover & Huber, 1984; Podsakoff, Mackenzie, Moorman & Fetter, 1990). Systematic attempts to explore the meaning and utility of such theory in educational organizations are quite recent. Linked closely to the idea of transformational leadership is the idea of transactional leadership. Transactional forms of leadership are premised on exchange theory. Various kinds of rewards from the organization are exchanged for the services of the teacher who is seen to be acting at least partly out of self-interest. Transactional leadership practices help

teachers recognize what needs to be done in order to reach a desired outcome. This, it is claimed, increases teachers' confidence and enhances motivation as well.

The corpus of theory and research travelling under the transformational leadership banner is by no means unified. It offers alternative prescriptions for leader behavior, alternative predictions about the effects of such practices on "followers" and alternative explanations of how these leader behaviors and effects are mediated (see Shamir, 1991). The conception of transformational leadership which seems most suitable for school restructuring has its theoretical genesis in Bandura's (1977, 1986) social cognitive theory and Shamir's (1991) self-concept based explanation of charisma. According to this view, transformational leaders increase their staffs' commitment by "recruiting" their self-concept, by increasing the salience of certain identities and values to an organizational vision or mission that reflects them. These transformational leadership effects can be explained as a product of conditions which enhance staff motivation and perceptions of self-efficacy.

Podsakoff et al (1990), reporting on the results of a comprehensive review of relevant research, suggested that almost all conceptions of transformational and transactional leadership are encompassed within eight dimensions of leadership practice. These dimensions have served as points of departure for the conception of leadership used in our own recent research (e.g., Leithwood, Jantzi & Fernandez, 1993; Leithwood, Jantzi, Silins, & Dart, in press; Silins, 1992): they can be defined and their effects briefly explained as follows:

- *Identifying and Articulating a Vision*: Behaviour on the part of the leader aimed at identifying new opportunities for his or her school, and developing, articulating, and inspiring others with his or her vision of the future. When visions are value laden, they will lead to unconditional commitment; they also provide compelling purposes for continual professional growth.
- *Fostering the Acceptance of Group Goals*: Behaviour on the part of the leader aimed at promoting cooperation among staff and assisting them to work together toward common goals. Group goals that are ideological in nature are especially helpful in developing group identity.
- *Providing Individualized Support*: Behaviour on the part of the leader that indicates respect for staff and concern about their personal feelings and needs (verbal persuasion). This dimension is likely to assure teachers that the problems they may encounter while changing their practices will be taken seriously by those in leadership roles and efforts will be made to help them through those problems.

• *Intellectual stimulation*: Behaviour on the part of the leader that challenges staff to reexamine some of the assumptions about their work and rethink how it can be performed. Such stimulation seems likely to draw teachers' attention to discrepancies between current and desired practices and to understand the truly challenging nature of school restructuring goals.

• *Providing an Appropriate Model:* Behavior on the part of the leader that sets an example for staff to follow which is consistent with the values the leader espouses. This behavior is aimed at enhancing teachers' beliefs about their own capacities, their sense of self-efficacy. Secondarily, such modelling may help create perceptions of a dynamic and changing job on the part of teachers.

• *High Performance Expectations:* Behavior that demonstrates the leader's expectations for excellence, quality, and high performance on the part of staff. Expectations of this sort help teachers see the challenging nature of the goals being pursued in their school. They may also sharpen teachers' perceptions of the gap between what the school aspires to and what is presently being accomplished. Done well, expressions of high expectations should also result in perceptions among teachers that what is being expected is also feasible.

Expert thinking and transformational leadership, as described in this section, served as a framework for collecting data from teachers and principals. The next section outlines how these data were collected and analyzed.

Method

Sample

Nine secondary school principals (4 female, 5 male) from one large urban school system participated in this study. They were nominated by at least two central office administrators as particularly effective school leaders who were actively engaged in significant school improvement efforts.

Data Collection

Interview. Evidence about the principals' thinking and problem-solving processes were collected through interviews about their efforts to deal with a current school improvement problem. Interviews, semi-structured and approximately one and one-half hours long, asked principals to select a school change initiative ("problem") underway in their schools that was a high priority for them; they were then encouraged to talk spontaneously about how they were solving that problem.

Prompts were limited mainly to questions of motive and intent. Other prompts included questions about the background of the problem, who initiated it, how many people and who was involved. After this spontaneous talk, specific questions related to our problem-solving model were asked. Principals were asked about what they hoped to accomplish, what values might be influencing their problem solving, what constraints might be impeding progress, and what were the specific steps taken to solve the problem. Most of this information was evident in the spontaneous talk, but these questions ensured a response from everyone.

Because in all cases their initiatives were ongoing, the interview was not, strictly speaking, retrospective. As a result, it avoids some of the objections to this type of verbal reporting (Ericsson & Simon, 1984).

Survey. As part of the larger study, staff members in the nine schools were surveyed about their perceptions concerning a wide array of conditions affecting their school improvement efforts. Relevant to this narrower study were the 47 items asking respondents to indicate, on a 5 point scale, their perceptions of behavior in relation to six dimensions of transformational leadership. A total of 295 teachers responded to the questionnaire. More details about our survey methods are described in Leithwood, Jantzi, and Fernandez (1993).

Data Analysis

Interviews. Interviews were tape recorded, subsequently transcribed, and content analyzed. Protocols, devoid of identifying information, were parsed into idea units (segments), numbered, and then coded according to a checklist of expert problem-solving subskills developed during prior research (Leithwood & Steinbach, 1992). On a rating sheet, the numbers of each segment were entered next to the appropriate code and a score of 0,1,2, or 3 was assigned to each code item. A score of 0 meant there was no use of that subskill; a score of 1 meant there was some indication of use; 2 showed the skill was present to some degree; and a score of 3 indicated either that the skill was present to a marked degree (frequently) or (more qualitatively) that it was a particularly fine example of the skill. Ratings for each item on the checklist were added to provide a total score. This score was considered to be a measure of the quality of the principal's problem-solving process, as defined by our model.

To ensure reliable coding, an analyst, unfamiliar with this work, was trained in its use. For the training, 2 randomly selected protocols were independently coded by the analyst and one of the authors. Differences were discussed until a high degree of

convergence was reached. The rest of the protocols were then independently scored by both analyst and author. Agreement ranged from a low of 76% to a high of 92% with a mean level of agreement of 81%. In all cases, initial differences of opinion were discussed until complete agreement was reached.

Survey. Following data entry and cleaning, a data file was compiled for responses to the survey. SPSSX was then used to calculate means, standard deviations, percentages, and correlation coefficients. The reliabilities (Cronbach's alpha) of the scales were calculated. Related T-tests were calculated to compare the total mean scores of each transformational leadership characteristic.

Results

Evidence collected in the study were examined from both quantitative and qualitative perspectives. Results of applying these perspectives are reported separately.

A Quantitative Perspective

Transformational leadership. Table 1 reports teachers' ratings (means and standard deviations) of the extent to which they perceived each dimension of transformational leadership being provided in their schools. Across all nine schools, teachers rated most in evidence those leadership practices intended to develop consensus among staff about school goals (m=3.66): least evident to teachers were leadership practices conveying high expectations for their performance (m=3.40). Differences among the ratings of the remaining four leadership dimensions, although small (from 3.50 to 3.60) were statistically significant in a number of cases, as Table 2 indicates.

Also provided by Table 1 are teacher ratings of leadership dimensions for each school. School 8 received the highest rating on all dimensions of leadership combined (m=3.79) as well as on all individual leadership dimensions except the creation of high expectations. Lowest rated, overall, was school 11 (m=3.35) which also rated lowest or very low all individual leadership dimensions except providing intellectual stimulation (m=3.56). While lowest, the overall mean rating of 3.35 for school 11 is still well above the midpoint of the rating scale, evidence that all nine schools were perceived by their staffs as providing a substantial degree of

transformational leadership. Indeed, differences among schools were not statistically significant.

Who is the source of this transformational leadership? This question is addressed in Table 3 which reports the percentage of teacher respondents in each school who identified each of eight possible sources of leadership. Across all schools, the principal, the administrative team and department heads acting as a group are the most frequently cited sources (by 55, 59 and 51% of respondents respectively). Vice principals and ad hoc committees were cited next most frequently (42 and 44%). Least frequently cited were teacher committees (27%), individual teachers (34%) and "other" sources (14%). This evidence suggests that leadership, while perceived to be widely distributed within the nine schools as a whole, also was perceived by the majority of teachers to be provided by those in formal leadership roles.

We were particularly interested in the principals' leadership. Schools varied widely in the percentage of respondents who identified the principal as a source of leadership. Eight-seven percent of respondents in school 7 identified the principal as compared with only 38% in school 8, for example. The significance of such differences are explored further in our qualitative analysis.

[insert Tables 1-3 here]

Expert Thinking. Table 4 summarizes the analysis of principals' verbal protocols. Our six-component model of expert administrative problem solving was used as the basis for the coding. For each principal and each component of problem solving, the Table indicates the number of relevant segments of transcribed text, the number of elements of expertise for which there was evidence, and the researchers' scoring of level of expertise. Also provided in Table 4 are scores of overall expertise for each principal and those aspects of the problem solving model most and least evident in the verbal protocols.

Our procedure for scoring problem-solving expertise allocated a maximum of 114 points to a protocol. The nine principals were awarded scores ranging from 48 (principal of school #5) to 70 points (school #6), a substantial range. But there were three distinct clusters of scores. Principals 6, 9, 11, 4 and 10 scored in the 64 to 70 range, principals 7 and 8 scored 58 and 57 respectively and principals 3 and 5 scored 49 and 48 respectively. While the problem solving of most of these principals compares favorably with expert samples studied in our previous research, there are

differences within the sample of a magnitude we would expect to be consequential in their practices.

[insert Table 4 here]

Expert thinking and transformational leadership practices compared. At the beginning of this paper, we argued for a conception of total quality leadership as a combination of expert thinking and transformational leadership practices. Although this combination seems defensible in theory, what about in practice? More precisely, is this combination commonly evident among school leaders reputed to be very good at what they do? Is there a direct, linear relationship between expert thinking and transformational leadership practices?

Table 5 summarizes evidence reviewed in the two previous sections of the paper in a manner that helps answer these questions. The nine principals are ranked in terms of the expertise of their thinking in the second column of the Table. In the third column, they are ranked on the basis of teachers' ratings of the extent to which transformational leadership was being provided in their schools (remember that teachers were not just rating principals, however). The fourth column ranks principals based on combined expert/leader ratings: we simply added the two ranks together to get a score (e.g., principal #9 ranked second on expertise and second on transformational leadership, thus receiving a score of 4, the best of the nine scores).

What does this Table say about our questions? First, and not surprisingly, at least very high levels of total quality leadership are not common even among these reputationally effective principals. Principal #9 appears to clearly "have it" - but she is the only one who does quite so clearly; so its appearance is possible but may be relatively rare, as far as we can tell from this study. Having said that, it is important to remember that all nine members of our sample demonstrated relatively high levels of both expertise and (to the extent our data can be relied on) transformational leadership; our answer must be interpreted in these highly relative terms. Second, evidence in Table 5 suggests that principals may be able to behave in ways that teachers perceive as transformational (keeping in mind the previous caveat about these ratings) even though we did not rate their thinking as expert as some of their colleagues who are perceived to behave less transformationally. The relationship between expertise and transformational practices appears to be non-linear. Principals 6 and 11 are ranked highly in terms of expertise (first and third) but much lower on transformational leadership (fifth and ninth). In contrast, principals 8 and

5 are ranked quite high on transformational leadership (first and third) but relatively low in expertise (seventh and ninth).

These quantitative results, then, raise at least two interesting questions: What does total quality leadership actually look like in practice? What seems to explain the discrepancies between levels of expertise and transformational leadership? To answer these questions, we turn to a qualitative analysis of our data.

[insert Table 5 here]

A Qualitative Perspective

Total quality leadership in practice. As the results of our quantitative analysis indicated, one principal of the nine in the study demonstrated both high levels of expert thinking and transformational leadership - our conception of the total quality leader. In this section, data collected through the problem-solving interview with this principal are used to exemplify total quality leadership in practice. While the six components of our problem-solving model provide the primary framework for this description, transformational leadership practices mentioned by the principal are noted, as they emerge.

Let's call the principal Sarah. At the time of data collection Sarah was 48 years of age, had been a vice principal for 3 years and a principal for 2 years after a 20-year career as teacher and department head. Sarah had been principal of her only and present large (97 staff, 1650 students) secondary school for 2 years at the time she was interviewed. While many changes were underway in the school, Sarah chose to discuss with us her thinking and practices related to implementation of anti-racist education. This was, for Sarah, focal among the many initiatives resulting from a formal needs assessment and "about fifteen, twenty other ways of collecting data" to help in the development of a strategic school plan. While such plans were mandated by the school system, Sarah's comments indicated that such a plan would have been developed with or without the mandate. She believed the five year plan she had inherited as the new principal had run its course ("It was a five year plan but I think it was really outdated").

What was noteworthy about the processes Sarah used primarily to understand the needs of her school and the priorities for school improvement - her interpretation and goal setting processes? With respect to problem interpretation, Sarah's understanding of what anti-racist education would mean in her school and its importance as a priority for the school was arrived at in a highly deliberative

fashion: this is clear in her references to data collection (above) and in the systematic way she involved others in interpreting these data. Staff, students, parents, principals of feeder schools and others were all part of this interpretation process, even though she "personally gathered ... all the information together [and spent] about three months, just in the evenings going over things to learn more about the school ...".

A second noteworthy aspect of Sarah's problem interpretation was the link she made between the need for anti-racist education and an even more encompassing purpose, "the whole equity issue we felt was important" (this link had the quite practical consequence of making her school eligible for additional resources). Third, Sarah's interpretation of the problem, as with other experts we have studied, was quite clear even though the plan for solving it was "a fluid process. We monitor what we are doing and evaluate it and make changes to our plan, but we do have a general direction that we are heading". And this general direction was conceived of by Sarah in both substantive and procedural terms. Substantively, the problem was, for example, to "...have much greater racial harmony and understanding and appreciation for the various cultures that are represented among our students and staff than we currently do ... We're losing out on some opportunities that we could be taking advantage of if we had a greater understanding of our student body and staff". Procedurally, Sarah described this as a "change problem" and assumed that it would be solved by adapting and applying many of the same techniques she had learned from previous change efforts.

A final noteworthy aspect of Sarah's problem interpretation was its grounding in a broader vision she was helping to develop for the school. It was a vision which embraced larger community concerns for racial harmony ("... people honoring each other's heritages and cultures ...") but could be acted on quite directly, within the school, through such initiatives as program changes and staff supervisory practices, for example. Nor was it a static vision. As Sarah described it, she and the staff were involved in an ongoing process of "working toward our vision of what this school should be". Sarah understood, as well, the need for the vision to be widely shared and understood in order for it to provide real direction for the staff, just as the more specific problem of implementing anti-racist education had to be widely shared and understood. This aspect of Sarah's problem interpretation processes appears to account for high ratings her staff gave her on the transformational leadership practice *building shared vision*.

So, Sarah developed a relatively clear interpretation of her problem, one firmly rooted in a shared and dynamic vision of her school. What was noteworthy about the *goal-setting* processes in which she engaged, processes also aimed primarily at understanding the problem? First, she arrived at a set of goals sufficiently detailed to reduce the complexity of the problem to something manageable. Until decomposed in this way, implementing anti-racist education seems an overwhelming challenge. But that was not the form of the problem on which Sarah acted. Instead, she and her staff identified such goals or "manageable bites" as, for example, finding and funding a project coordinator, raising staff awareness of racist practices, initiating curriculum changes, convincing parents of the importance of the problem, communicating with feeder schools about this as a priority and the like.

Noteworthy as well, was Sarah's ability to keep the interests of the students at the center of her purposes: "We want to get beyond that stage [raising awareness] to the nitty gritty of making a difference in the curriculum for the kids in the classroom". Like other expert school leaders we have studied in the past, Sarah's goals also acknowledged a role for all legitimate stakeholders in the school. Goals were identified not only for students, but also for parents and staff: "it's an issue school wide, so we wanted to make sure that we had the other representation from the other areas of the school on board too, because the secretaries meet the students at the counter, caretakers and A.V. [people] work with students".

Finally, with respect to goals, Sarah's thinking demonstrated her appreciation for the importance of building a broad understanding and consensus among all stakeholders for the nature of the problem and the goals that would need to be achieved to solve it. In order for the goals to actually be accomplished, Sarah noted, they "... had to be in the department head objectives, had to be in our objectives, mine as a principal, my admin team's objectives ... and also teachers had to have ownership". Such consensus building began at the point of interpreting needs assessment data and took the form of encouraging widespread participation in decision-making. Sarah mentioned discussions aimed at building goal consensus at department head meetings, at staff meetings where each teacher had an opportunity to indicate their priorities, as well as "with the caretakers and the secretarial staff and our school community executive". Indeed, Sarah pointed out that three meetings were held with this last group "because they weren't quite as close to the issue" as people in the building and "we wanted to make sure they understood where these [goals and priorities] came from and what they might involve". It is not hard to

understand why Sarah's staff gave her high marks for the transformational leadership practice *developing consensus about group goals.*

Processes included in components of our problem solving called *values* and *mood* help in both understanding and solving problems. What was Sarah's thinking like with respect to these components and how was it related to transformational leadership practices? Our answer to this question is based largely on the nature and role of Sarah's values. Results of our previous research suggest that such *values* and/or principles are a pervasive aspect of expert school leaders' problem solving. This was certainly the case in Sarah's approach to identifying, as a priority, and then to implementing anti-racist education in her school. Indeed, one of her long term goals for solving this problem indicates just how much value she attached to values; ultimately, she explained, we hope to "... make a difference in the value system of the students and how they are going to feel for life".

Being able to explicate and then consciously use one's values, sometimes as substitutes for knowledge, is characteristic of expertise. Sarah's thinking was shaped by at least five reasonably explicit values. The most influential of her values was *consequences for students*, a pragmatic value that we and others have argued ought to be at the apex of a principal's values hierarchy (Green, 1987; Begley & Leithwood, 1991; Leithwood, Begley & Cousins, 1992). Sarah believes that schools have an opportunity to make a difference in students' lives because they are at an age when their values are still developing. "...We have to prepare them for the world they are going to experience when they finish school and the world they are going to live in". Students' self-image is important and this belief helps guide her problem solving. "I think they [students] have to have a really good self-image if they are going to be successful no matter what they do in life". And racism, of course, can do much to erode a student's self image.

Sarah's problem solving was also influenced by values which we label knowledge, participation and respect for staff. That *knowledge* was valued by Sarah is evident, for example, in her extensive collection of information for problem solving. She spent considerable time before entering the school meeting with department heads individually to learn about the school and its value system so she could "help them to do their jobs better". She believed that if everyone was more aware of the actual cultural diversity in the school, they would be more likely to take advantage of it to enhance the curriculum. Other evidence includes her meetings with the school community executive so they could understand the issues and be able to make informed decisions.

Sarah valued widespread *participation* in decision making in her school. "There's no point in me saying hey folks, this is what we are going to work on. Wrong". She believes that participation leads to commitment. "If people feel a part of the decision making process then I think you are halfway there in terms of doing something about it". But the participation should be voluntary; people shouldn't be dragged in. Participation also means sharing of ideas through committee structures which have interconnected pathways.

Sarah valued her staff. She valued them because many had considerable professional expertise, in her view. As well, however, she respected their basic rights to be treated humanely and fairly. This was evident even when staff behaviors were at odds with Sarah's own beliefs and values. For example, sexist or racist comments by staff were confronted directly ("I can't condone this in my school") but in a way that clearly separated the behavior from the person ("it's not that you are a bad person, and I like you as a person. It's the behavior that I can't tolerate").

A final "professional" value strongly held by Sarah we call *role responsibility*. This value was evident in her reflections on her own responsibilities in solving the anti-racist education problem. She believed that she must demonstrate that equity is an important focus. One way she did that was to acquire additional resources so that a project director could be hired. "You need", as she pointed out, "someone to be accountable or nothing is going to happen". Sarah also believed that it was necessary for her own values to be congruent with the school's; you must be authentic. "You have to be working from your own set of values to do a good job ... you can't fake it and do a good job". Her role included being an educator. "I'm a principal, but first I'm a teacher. That's part of what principals do. You are still teaching but you are working with your staff as opposed to students directly".

In sum, then, Sarah was quite clear about her own values, and demonstrated the use of five such values as explicit instruments in her problem solving. In what ways, then, does this aspect of Sarah's problem solving touch on transformational leadership? First, her vision is value-based and hence offers the potential to attract strong, even ideological commitment on the part of others (Shamir, 1991); the vision may help transform staffs' prevailing views about the importance of their work, a means through which *high performance expectations* can be expressed. Second, Sarah strives to eliminate sources of conflict with dominant school values, potentially adding to the sense of coherence and meaningfulness people feel about their work in the school (Bandura, 1986), a form of *individualized support*. And

because she attempts to behave in ways that are consistent with the values she considers important, she *models behavior* important in moving toward the school's vision. Fourth, Sarah respects her staff and values their participation in the school, thereby creating important conditions for further developing their sense of self-efficacy; eventually this may strengthen their attachment to the school, increase their willingness to persist in solving school problems (Ford, 1992; Bandura, 1986) - one meaning of *providing intellectual stimulation*.

Evidence concerning Sarah's mood was relatively sparse and so we offer little comment about it here. Suffice to say that, even though a relative novice in the principals' role she displayed considerable self-confidence, a characteristic of experts generally. Such self-confidence is likely a product, in part, of being clear about one's values and having considerable experience in solving similar problems. Although new to the role, Sarah seems to have had such experience in other roles. Such self-confidence may encourage staff to risk the changes in practice required for school improvement. and is sometimes offered as a partial explanation for attributions of charisma, a quality often associated with transformational leadership.

Components of our problem-solving model called *constraints* and *solution processes* are aimed primarily at solving problems. To avoid redundancy, we describe here only Sarah's approach to constraints and its relationship to transformational leadership practice. First, like other experts Sarah appeared especially adept at anticipating obstacles or constraints and planning for how they could be managed ahead of time. She identified, for example, the usual constraints of resources and money and helped to address those by hiring a project director. Anticipating less than overwhelming agreement for anti-racist education as a priority, she involved all stakeholders from the outset in interpreting needs assessment information. Such anticipation is likely to foster a belief on the part of stakeholders that the context within which they are being asked to change will be supportive of their efforts. Such beliefs increase commitment and are part of *building consensus about group goals*.

Second, while Sarah identified several constraints, she viewed none of them as impenetrable. In fact she believed that if you want something enough, "... you persist and work to remove those barriers ... and there are ways to do it". Displaying this attitude is one way of expressing *high expectations* for not only your own performance but the performance of others, as well. It also expresses confidence in one's ability to solve problems.

Finally, Sarah displayed a reflective quality in her approach to constraints. For example, an invited speaker proved to be disastrous but she made the most of what could be learned from the event and also inspected her role in the debacle. "So part of it I think we weren't clear enough in our expectations when we discussed with her what we wanted". Consciously working in this way, particularly with staff to learn from mistakes, is yet another way of *providing intellectual stimulation.*

Explaining "partial quality leadership". Among the nine secondary principals in the study, four provide especially interesting cases of what, on the basis of our quantitative analysis, seems to be "partial quality leadership" (see Table 5). Two principals (#6 and 11) demonstrated exceptionally high levels of problem solving expertise (ranked first and third respectively) but were ranked substantially lower in terms of transformational leadership practices (fifth and ninth respectively). Two other principals (#8 and 5) demonstrated the opposite pattern: relatively high rankings for transformational leadership (first and third respectively) but relatively low rankings for problem solving expertise (seventh and ninth respectively). What accounts for this partial quality leadership? As we puzzle through this question, it will be important to remember that at least seven of these nine principals are unusually expert and all are quite transformational as compared with more representative samples of principals. The term "partial quality leadership" in reference to any of the nine only makes sense when, for example, Sarah is the standard of comparison.

Let's consider, first, principals 6 and 11 whose problem-solving expertise ranked very high but transformational leadership practices ranked much lower. Three reasons help explain the lower transformational leadership rankings:

- *Scope of leadership influence:* the changes being initiated by both of these principals were in the early stages and had not yet begun to involve a significant proportion of the school staffs. Principal 11, for example, was working primarily with members of the administrative team and, when examined separately, we found that they rated the principal's transformational leadership very highly. So lower transformational leadership ratings may mean that the principal's leadership practices have been experienced by relatively few staff members;
- *Stage in change process:* the initial focus of the change effort for both principals was programmatic, centered on developing classroom-based initiatives to foster student growth. Not until the substance of these changes was more fully developed

was attention likely to shift to concerns for building the staff commitment and capacity needed to fully implement the changes;

- *Ambiguous exercise of power:* one of these two principals appeared to be uncertain about giving autonomy to staff members (facilitative power) as opposed to maintaining personal control over decision making. Because transformational leadership is rooted firmly in the exercise of facilitative power, staff members' perceptions of this ambiguity would be likely to lower their ratings of this principal's transformational leadership.

Two of these three reasons suggest that the transformational leadership ratings received by principal 11 and 6 may have been depressed because of the particular context in which they were working. Furthermore, evidence provided by the problem-solving interviews with these principals suggested considerable likelihood that, in different circumstances, staff would be likely to rate significantly higher these principals' transformational leadership practices. For example, both principals:

- articulated the kind of broad and compelling vision for their schools likely to attract high levels of teacher commitment ("I think the basic premise that faced us was that there were questions of equity ... in this community ... [and] that our students were sold short in terms of success in school and therefore in life");
- demonstrated sensitivity to the importance of building a consensus about school goals across the school staff, as a whole ("There can be individual means and differences, but there has to be a 'degree of commonality' and that commonality has to be addressed in terms of the goals and objectives and that commonality would best be expressed in terms of student outcomes");
- appeared to understand the importance of treating individual staff members uniquely, when necessary, and providing the support each needed to contribute to the changes being undertaken in the school ("... we can provide ... the professional development to help them get over, in some cases, their own fears or apprehensions");
- had plans for significant staff development as part of the changes they were developing with staff and saw themselves at least encouraging staff to question their existing practices ("... raise people's understanding, almost begin to sow the seeds of ... cognitive dissonance that would create that intrapersonal jarring note that ... causes or that allows people, hopefully, to step back and begin to question their own practices");

- interpreted a number of their own actions as modelling beliefs and values they considered to be an important part of their school's culture ("I have represented the school at both of those [community resource groups] because I see that very much as part of my role as principal. Don't delegate this ...").

In sum, then, our evidence explains the lower transformational leadership scores of principals 6 and 11 largely as a function of the point in time in which we inquired about their work. Their thought processes displayed a propensity toward the use of transformational practices likely to become more evident to their staffs, we speculate, as their work progresses.

How can the combination of high transformational leadership and lower problem solving expertise rankings of principals 8 and 5 be explained? The answer to this question is fairly straightforward. Both principals were working on problems that addressed staff working conditions quite directly, rather than more fundamental problems of, say, student growth. Their leadership practices, in response to those problems, were highly visible to most staff members, were aimed at redressing important but short-term dilemmas and resulted in immediate payoffs for staff. In neither case, however, was there evidence to suggest that these principals interpreted their change initiative as part of a larger, more fundamental problem to be resolved by the school. Similarly, the goals set for problem solving were relatively narrow in scope and largely concerned with staff as distinct from such other school constituents as students. Within the framework established by such goals, however, their thinking was fairly expert.

In sum, these two principals were perceived as highly transformational but in response to relatively narrow, short-term problems to be solved in their schools. Because their thinking showed few signs, for example, of a broader vision for the school, we speculate some difficulty in maintaining high levels of teacher commitment to the school once these short-term problems are resolved.

Conclusion

Evidence from a study of nine secondary school principals has been used in this paper to demonstrate what it means to conceptualize "total quality leadership" as a combination of expert thinking and transformational practices. One principal in our study, Sarah, exemplified total quality leadership in practice. The capacity only

to exhibit transformational practices is not sufficient for total quality leadership, we argued; sometimes at least widespread application of such practices will be premature, as principals 6 and 11 demonstrated; and sometimes they will be applied in the service of excessively narrow purposes, as principals 5 and 8 illustrated. Expert thinking is particularly crucial for total quality leadership. It provides the cognitive flexibility leaders need to act productively in their highly contingent contexts. Such thinking also appears to create a propensity to act transformationally, in the long run, and in the service of relatively fundamental and broadly conceived purposes.

These claims, of course, rest on a small and shaky empirical foundation at this point. Subsequent research to shore up this foundation would employ measures of transformational leadership unambiguously about the principal, as opposed to multiple sources of leadership in the school, for example. Such research might also measure expertise in alternative ways, perhaps adding batteries of well-tested psychological instruments to our qualitative, less well-tested measurement procedures. Samples of principals more widely distributed in their expertise and transformational practices might also sharpen some of the distinctions we found to be useful in our data.

If total quality leadership is to be compared with other "new leadership paradigms", it parallels most closely the cognitive-behavioral perspective on leadership described by Sims and Lorenzi (1992) but with a focus on *leaders'* rather than *followers'* cognitions and behaviors. Transformational leadership theory is not sufficient for total quality leadership because it awards too little explicit weight to the mind of the leader. Expert thinking is not sufficient either; while it may increase the probability of transformational practices being used when appropriate, it is no guarantee. As more sophisticated evidence accumulates about the effects of transformational practices, we may anticipate increasingly reliable and contextually sensitive advice about potentially useful leadership behaviors. These are likely to be behaviors that are helpful to leaders' colleagues in developing personally constructed but socially shared understandings of their work (Leithwood & Duke, in press) and how the quality of such work can be continuously improved.

Notes

1 This section is an abbreviated excerpt from Leithwood, Steinbach, & Raun (in press).

2 The sources of evidence we allude to below include Leithwood and Stager (1989), Stager and Leithwood (1989), Leithwood and Steinbach (1990), Leithwood and Steinbach (1991), Begley and Leithwood (1990), Campbell-Evans (1988), Leithwood, Begley and Cousins (1992), Leithwood and Steinbach (in press).

3 This section is an adapted excerpt from Leithwood, Jantzi and Fernandez (1993).

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Table 1

Teachers' Ratings of the Extent to Which Transformational Leadership Was Being Provided (N=295)

Constructs	*School #3*		*School #4*		*School #5*		*School #6*		*School #7*		*School #8*		*School #9*		*School #10*		*School #11*		*Mean*
	M	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	*M*	*sd*	
Vision	3.56	.78	3.43	.65	3.49	.66	3.55	.65	3.35	.82	3.72	.59	3.61	.74	3.50	.64	3.26	.65	3.50
Model	3.64	1.01	3.63	.88	3.73	.78	3.58	.75	3.54	.86	3.87	.77	3.84	.80	3.43	1.06	3.21	.83	3.60
Grp Goals	3.68	.81	3.67	.66	3.66	.56	3.68	.66	3.36	.87	3.93	.69	3.76	.64	3.60	.68	3.62	.57	3.68
Ind Support	3.63	.82	3.54	.73	3.63	.69	3.70	.70	3.24	.87	3.77	.66	3.72	.76	3.59	.68	3.30	.79	3.57
High Expect	3.25	.87	3.57	.63	3.50	.62	3.36	.76	3.58	.66	3.49	.92	3.51	.66	3.24	.87	3.13	.66	3.40
Intell Stim	3.48	.79	3.59	.54	3.51	.63	3.49	.51	3.37	.71	3.79	.68	3.54	.71	3.31	.79	3.56	.69	3.52
MEAN	*3.54*	*.76*	*3.57*	*.58*	*3.59*	*.59*	*3.56*	*.55*	*3.41*	*.70*	*3.79*	*.63*	*3.66*	*.65*	*3.44*	*.69*	*3.35*	*.59*	
RANK	6		4		3		5		8		1		2		7		9		

Table 2

Differences in Teachers' Ratings of Transformational Leadership Dimensions Across All Schools

	Vision	Modelling	Group Goals	Support	Expectations	Stimulation
Vision		*	*	*	*	
Modelling	*				*	*
Group Goals	*			*	*	*
Support	*		*		*	
Expectations	*	*	*	*		*
Intellectual Stimulation		*	*		*	

* p=<.05 using a related T-test

Table 3

Sources of Leadership

	Principal		*Vice Principal*		*Admin Team*		*Committees DH*		*Committees TS*		*Ad Hoc Committes*		*Individual Teachers*		*Other*		*Total Resp.*
Sch. #	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	*%*	*Freq*	
3	53	(20)	55	(21)	58	(22)	58	(22)	34	(13)	63	(24)	50	(19)	8	(3)	38
4	58	(25)	33	(14)	58	(25)	58	(25)	21	(9)	44	(19)	26	(11)	21	(9)	43
5	54	(21)	49	(19)	64	(25)	49	(19)	31	(12)	36	(14)	44	(17)	13	(5)	39
6	48	(14)	52	(15)	52	(15)	41	(12)	21	(6)	41	(12)	28	(8)	10	(3)	29
7	89	(16)	33	(6)	39	(7)	39	(7)	11	(2)	39	(7)	11	(2)	11	(2)	18
8	38	(10)	31	(8)	50	(13)	54	(14)	27	(7)	58	(15)	38	(10)	23	(6)	26
9	71	(27)	37	(14)	63	(24)	47	(18)	26	(10)	58	(22)	55	(21)	8	(3)	38
10	48	(11)	30	(7)	61	(14)	65	(15)	17	(4)	17	(4)	17	(4)	9	(2)	23
11	44	(18)	49	(20)	71	(29)	46	(19)	44	(18)	34	(14)	24	(10)	17	(7)	41
Mean	**55%**		**42%**		**59%**		**51%**		**27%**		**44%**		**34%**		**14%**		**295**

Table 4

Principals' Problem-Solving Scores

School #	Interpretation			Goals			Values			Constraints			Solution Processes			Mood			Total Score
	scr[1]	segs[2]	elems[3]	scr	segs	elems	scr	segs	elems	scr	segs	elems	scr	segs	elems	scr	segs	elems	
6	13	20	5	10	16	5	19	29	7	7	17	3	20	35	9	1	1	1	70
9	14	13	7	13	14	5	20	21	8	7	13	3	13	32	7	2	1	1	69
11	16	19	7	10	7	4	16	27	8	8	16	3	16	26	8	1	1	1	67
4	14	25	5	9	9	5	18	28	8	7	33	3	16	25	7	3	5	1	67
10	11	15	5	7	7	4	18	46	8	9	20	3	16	20	8	3	4	1	64
7	13	19	6	8	6	3	17	24	8	5	8	3	13	30	7	2	4	1	58
8	10	19	5	10	11	4	20	53	8	4	8	2	12	25	6	1	1	1	57
3	11	15	7	7	10	4	15	26	7	6	16	2	7	15	4	3	3	1	49
5	9	17	5	4	6	2	14	24	6	6	17	3	14	20	7	1	1	1	48
Mean	*12.3*	*18*	*5.8*	*8.7*	*9.6*	*4*	*17.4*	*30.9*	*7.6*	*6.6*	*16.4*	*2.8*	*14.1*	*25.3*	*7*	*1.9*	*2.3*	*1*	*61*

1 scr = score awarded by raters

2 segs = number of idea units coded

3 elems = number of subcomponents for which there was evidence

Table 5

A Comparison of Principals' Problem-Solving Expertise and Levels of Transformational Leadership

Rank hi ⇒ lo	*Problem-Solving Expertise (Rank Order)*	*Transformational Leadership (Rank Order)*	*Combined PS Rank & TL Rank = Score (Rank Order)*
1	S#6	S#8	S#9 =4
2	S#9	S#9	S#6 =6
3	S#11	S#5	S#8 =8
4	S#4	S#4	S#4 =8
5	S#10	S#6	S#5 =12
6	S#7	S#3	S#10 =12
7	S#8	S#10	S#11 =12
8	S#3	S#7	S#3 =14
9	S#5	S#11	S#7 =14

References

Bandura, A. (1986). *Social foundations of thought and action.* Englewood Cliffs, NJ: Prentice-Hall.

Bandura, A., (1977). *Social learning theory.* Englewood Cliffs, NJ: Prentice-Hall.

Bass, B.M. (1985). *Leadership and performance beyond expectations.* New York: The Free Press.

Bass, B.M., & Avolio, B.J. (1989). Potential biases in leadership measures: How prototypes, lenience, and general satisfaction relate to ratings and rankings of transformational and transactional leadership constructs. *Educational and Psychological Measurement, 49,* 509-527.

Bass, B.M., Waldman, D.A., Avolio, B.J., & Bebb, M. (1987). Transformational leadership and the falling dominoes effect. *Group and Organizational Studies, 12,* 73-87.

Begley, P., & Leithwood, K. (1991). The influence of values on school administrators' practices. *Journal of Personnel Evaluation in Education, 3*(4), 337-352.

Bonstingl, J. (1992). The quality revolution in education. *Educational Leadership, 50*(3), 4-9.

Bradley, L.H. (1993). *Total quality management for schools.* Lancaster: Technomic Publishing Company.

Bransford, J. (in press). Who ya gonna call? Thoughts about teaching problem solving. In P. Hallinger, K.A. Leithwood & J. Murphy (Eds.), *Cognitive perspectives on educational leadership.* New York: Teachers College Press.

Burns, J.M. (1978). *Leadership.* New York: Harper & Row.

Campbell-Evans, G. (1988). The relationship between principals' values and their decision-making processes. Unpublished doctoral dissertation, Toronto, OISE.

Conger, J. (1989). *The charismatic leader*. San Francisco: Jossey-Bass.

Ericsson, K.A., & Simon, H.A. (1984). *Protocol analysis: Verbal reports as data*. Cambridge, MA: The MIT Press.

Ford, M. (1992). *Motivating humans: Goals, emotions and personal agency beliefs*. Newbury Park: Sage.

Gagné, E.D. (1985). *The cognitive psychology of school learning*. Boston: Little, Brown & Co.

Glaser, R., & Chi, M. (1988). Overview. In M. Chi, R. Glaser & M. Farr (Eds.), *The nature of expertise* (pp. xv-xxviii). Hillsdale, NJ: Lawrence Erlbaum.

Green, T.F. (1987). The conscience of leadership. In L. Sheive & M. Schoenheit (Eds.), *Leadership: Examining the elusive*. 1987 Yearbook of the Association of Supervision and Curriculum Development.

Greeno, J.G. (1978). A study of problem solving. In R. Glaser (Ed.), *Advances in instructional psychology, Volume 1* (pp. 13-75). Hillsdale, NJ: Lawrence Erlbaum.

Hallinger, P., Leithwood, K., & Murphy, J. (Eds.). (in press). *Cognitive perspectives on educational leadership*. New York: Teachers College Press.

Hayes, J. (1981). *The complete problem solver*. Philadelphia: The Franklin Institute Press.

Hayes, J.R. (1980). Teaching problem-solving mechanisms. In D. Tuma & R. Reif (Eds.), *Problem solving and education* (pp. 141-150). New York: John Wiley.

Horine, J., & Bass, B. (1993). *Transformational leadership: The cornerstone of quality*. CLS Report 92-3 (January).

Hunt, J.G. (1991). *Leadership: A new synthesis*. Newbury Park, CA: Sage.

Kelsey, J.G.T. (in press). Learning from teaching: Problems, problem formulation, and the enhancement of problem-solving capability. In P. Hallinger, K. Leithwood & J. Murphy (Eds.), *Cognitive perspectives on school leadership*. New York: Teachers College Press.

Leithwood, K. (1992). The move toward transformational leadership. *Educational Leadership, 49*(5), 8-12.

Leithwood, K., Begley, P., & Cousins, B. (1992). *Developing leaders for future schools*. London: Falmer Press.

Leithwood, K., & Duke, D. (in press). Defining effective leadership for Connecticut's future schools. *Journal of Personnel Evaluation in Education*.

Leithwood, K., Jantzi, D., & Fernandez, A. (1993, April). *Secondary school teacher commitment to change: The contributions of transformational leadership*. Paper presented at the annual meeting of the American Educational Research Association, Atlanta.

Leithwood, K., Jantzi, D., Silins, H., & Dart, B. (in press). Using the appraisal of school leaders as an instrument for school restructuring. *Peabody Journal of Education*.

Leithwood, K., & Stager, M. (1989). Expertise in principals' problem solving. *Educational Administration Quarterly, 25*(2), 126-161.

Leithwood, K., & Steinbach, R. (1991). Indicators of transformational leadership in the everyday problem solving of school administrators. *Journal of Personnel Evaluation in Education, 4*(3), 221-244.

Leithwood, K., & Steinbach, R. (1991a). Components of chief education officers' problem solving. In K. Leithwood & D. Musella (Eds.), *Understanding school system administration* (pp. 127-153). New York: Falmer Press.

Leithwood, K., & Steinbach, R. (1992). Improving the problem-solving expertise of school administrators: Theory and practice. *Education and Urban Society, 24*(3), 317-345.

Leithwood, K., & Steinbach, R. (in press). The relationship between variations in patterns of school leadership and group problem-solving processes. In K. Leithwood, P. Hallinger, J. Murphy (Eds.), *Cognitive perspectives on educational leadership*. New York: Teachers College Press.

Leithwood, K., Steinbach, R., & Raun, T. (submitted for publication). Prospects for organizational learning in expertly managed group problem solving. In K. Leithwood (Ed.), *Transforming politics into education: Perspectives on effective school system leadership.*

Murphy, J. (1991). *Restructuring schools: Capturing and assessing the phenomena.* New York: Teachers College Press.

Newell, A. (1975). Discussion of papers by Robert M. Gagné and John R. Hayes. In B. Kleinmuntz (Ed.), *Problem solving: Research, method and theory* (pp. 171-182). Huntington, NY: Robert E. Kreiger.

Newell, A., & Simon, H. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.

Newell, A., Rosenblum, P., & Laird, J. (1989). Symbolic architectures for cognition. In M. Posner (Ed.), *Foundations of cognitive science* (pp. 133-160). Cambridge, MA: The MIT Press.

Newmann, F. (1993). Beyond common sense in educational restructuring. *Educational Researcher, 22*(2), 4-13.

Nickerson, R.S. (1988-1989). On improving thinking. In E.Z. Rotherkopf (Ed.), *Review of research in education, Volume 15* (pp. 3-57). Washington, DC: American Educational Research Association.

Podsakoff, P.M., MacKenzie, S.B., Moorman, R.H., & Fetter, R. (1990). Transformational leaders' behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors. *Leadership Quarterly, 1*(2), 107-142.

Podsakoff, P.M., Todor, W.D., Grover, R.A., & Huber, V.L. (1984). Situational moderators of leader reward and punishment behavior: Fact or fiction? *Organizational Behavior and Human Performance, 34*, 21-63.

Posner, M. (Ed.). (1989). *Foundations of cognitive science.* Cambridge, MA: The MIT Press.

Reitman, W. (1965). *Cognition and thought.* New York: Wiley.

Rumelhart, D.E. (1989). The architecture of mind: A connectionist approach. In M. Posner (Ed.), *Foundations of cognitive science* (pp. 93-132). Cambridge, MA: The MIT Press.

Sashkin, M., & Kiser, K. (1992). *Total quality management.* Seabrook, MD: Ducochon Press.

Seltzer, J., & Bass, B. (1990). Transformational leadership: Beyond initiation and consideration, *Journal of Management, 16*(4), 693-703.

Sergiovanni, T.J. (1990). *Value-added leadership: How to get extraordinary performance in schools.* San Diego: Harcourt Brace Jovanovich.

Shamir, B. (1991). The charismatic relationship: Alternative explanations and predictions. *Leadership Quarterly, 2*(2), 81-104.

Showers, C., & Cantor, N. (1985). Social cognition: A look at motivated strategies. *Annual Review of Psychology, 36*, 275-305.

Silins, H.C. (1992). Effective leadership for school reform. *The Alberta Journal of Educational Research, 38*(4), 317-334.

Sims, H., & Lorenzi, P. (1992). *The new leadership paradigm*. Newbury Park: Sage.

Van Lehn, K. (1989). Problem solving and cognitive skill acquisition. In M.I. Posner (Ed.), *Foundations of cognitive science* (pp. 527-579). Cambridge, MA: The MIT Press.

Voss, J.F., & Post, T.A. (1988). On the solving of ill-structured problems. In M.T.H. Chi, R. Glaser & M.J. Farr (Eds.), *The nature of expertise* (pp. 261-285). Hillsdale, NJ: Lawrence Erlbaum.

Willis, S. (1993). Creating total quality schools. *ASCD Update*, 35(2), 1-4.